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HORTICULTURIST,

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SOUTHERN SECTION OF THE UNITED STATES.

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Terms of the Southern Agriculturist.

Three Dollars, payable in advance;—for two copies $5; Societies and Clubs can be supplied with ten copies for $20, payable in advance.

Black Oak Agricultural Society.

The following Resolutions are offered for publication, by direction of the Society, with a view of calling the attention of planters to the subject, and of inducing those who are conveniently located, to test the practicability of making Marl an article of domestic trade.

H. W. RAVENEL, *Secretary & Treasurer.*

Resolved, That the owners of Marl deposits within the limits of this Society, and contiguous to the water courses and Santee Canal, and public roads, be earnestly invited and requested to make experiments in the course of the ensuing summer and autumn, when the diminished labor of the plantation will allow the necessary time and opportunity, as to the practicability and cost of preparing that manure for the supply of such remote locations as may require it, and to report the result thereof to this Society, at its meeting in November next, estimating, as accurately as may be, the cost of digging and depositing it upon the banks of the river or canal, and the cost of further transportation by boat or wagon, per mile.

Resolved, That a SILVER MEDAL be presented to the individual, whose experiment and estimate, shall in the judgment of the committee instituted to award premiums, best test the practicability of making Marl an article of internal domestic trade—such experiment and calculation to be presented in a written form.

THE SOUTHERN AGRICULTURIST.

(NEW SERIES.)

Vol. III. FOR SEPTEMBER, 1843. No. 9.

PRIZE ESSAY.*

ON THE PREPARATION AND USE OF MANURES.

By Willis Gaylord, of Otisco, N. Y.

Of all the pursuits to which mankind, from necessity or inclination, have devoted themselves, there is none more honorable,—certainly none more useful,—than that of agriculture. To pursue this business successfully, knowledge, extensive and varied, is required; for, although a man may succeed by following the beaten paths of his predecessors, occasions will frequently arise, when the end desired may be attained by methods much shorter than those usually adopted, if the farmer is able to form and apply them. It is here science has, within a few years, rendered the most essential aid to agriculture. Sometimes, reasoning from well known effects to their causes, the agricultural chemist has placed in the hands of the farmer the means of producing results, always desirable, but which, under the older systems of farming, with his utmost care, he frequently failed of obtaining. Again, taking well established facts in animal or vegetable physiology as his starting point, he has arrived at results of the highest practical importance, and is enabled to render more certain and effective the more tardy operations of nature. In no department of agricultural industry, it is believed, have labors of science been more beneficial or more apparent than in that of the preparation and use of manures; certain it, is there is no department more deserving attention, or where an elucidation of the principles and laws that govern the growth of plants, acts with a more direct and energetic influence.

A definition of the term manure, may be necessary, in order to treat the subject understandingly, as different individuals use the word in widely different senses, some in a wide, and some in a limited one. A few instances of the meaning put upon the term will be given from a few of the modern writers who have adverted to this topic. Thus Dr. Leiber, in his German Conversationes Lexicon, defines manure to be "vegetable, animal and mineral matters, introduced into the soil to accelerate vegetation, and increase the production of crops." The Encyclopedia, published by the London Society for the Promotion of Useful Knowledge,

*This Essay is from a recently published volume, entitled the *New-York State Agricultural Society's Transactions*, and is spoken of very highly in the American Farmer, as well deserving of the prize it won for its erudite author.

thus defines it:—"Every substance which has been used to improve the natural soil, or to restore to it the fertility which is diminished by the crops annually carred away, has been included in the name of manure." Loudon, in his great work on Agriculture, says—"Every species of matter capable of promoting the growth of vegetables, may be considered as manure." Prof. Low, in his Elements of Agriculture, says—"All substances which, when mixed with the matter of the soil, tend to fertilize it, are in common language termed manures." Mr. Johnson, in his "Farmer's Encyclopedia," lately published, says—"A manure may be defined to be any fertilizing compound or simple ingredient added to a soil, of which it is naturally deficient." The definitions of Prof. Leibig and Dr. Dana, two of the latest writers on the subject, do not differ essentially from those already given. Of these definitions, I prefer the most simple and comprehensive, that of Loudon, and in this paper shall consider the term manure, as embracing every substance capable of promoting the growth of plants.

Manures, by some, are classed as earthy, organic and saline; others divide them into animal and vegetable, mineral and mixed manures, and some speak of them as composed only of geine or humus and salts. Others call them as organic and inorganic; but these divisions are of little consequence, as every farmer understands that manure is the result of decomposition or change; and that, whether organic, that is, derived from animal or vegetable matter, or inorganic, such as the earths, clay, lime, the alkalies, &c., it is only efficient when presented to plants in certain forms, such as decomposition, division or solution. In France, they have terms to distinguish those substances which act mechanically in improving the texture of the soil, from those which act directly in the nourishment of the plant. The former class of substances they call *amendements*, and the latter ones *engrais*. It is probable, however, that the system which considers all manures as consisting of humus or geine, and salts, comprehending, in the latter term, all the mineral substances that enter into the growth or nourishment of vegetables, will eventually be found the most simple, and at the same time the most accurate of all the proposed divisions of manures. Thus humus constitutes the source of the carbon, forming the principal part of the structure of plants, and the salts, where they do not enter into the structure of plants, are active in preparing the other inorganic elements, and exciting the vegetable organs in their reception and appropriation of nutriment.

Humus or geine is simply decomposed animal and vegetable matter, and as from it, by the action of oxygen, carbonic gas is derived, to be absorbed by water and taken up by the roots, or mixed with the atmosphere and taken up by the leaves of plants; or, as some agricultural chemists with good reason suppose, in under certain circumstances dissolved, or is soluble, and thus rendered fit for immediate nourishment to plants, it must be consid-

ered the most important item in the production of manures. The salts, which are the most efficient in aiding vegetation, or the most active manures, are those formed from the alkalies and their various combinations. Thus, from pure lime or calcium, is formed, by the union with carbonic acid, *carbonate of lime;* with phosphoric acid, *phosphate of lime*, the base of bones, one of the most efficient of fertilizers; with sulphuric acid, *sulphate of lime*, or gypsum, the value of which is well understood; and so with the other alkalies, which, in their combinations, from substances of the utmost consequence to plants. It is well known that the outer covering of some kinds of cane, contains so much flint of silex as to strike fire with steel; and some of the grasses contain the substance in such quantity that their ashes will melt into glass with potash. Now, this hardness, so necessary to their perfection, could not be attained unless this flint had been rendered soluable by union with an alkali, forming a silicate of potash, and by this solubility been rendered fit for the action and appropriation of the plant.

If we would know what kind of food is required by plants, one of the first steps necessary is to ascertain of what the plants themselves are composed. The combinations of matter may be said to be absolutely endless; but the original elements of this multitude of combinations, are few in number. Chemistry has detected only some fifty-five substances incapable of further reduction, or what are called simple substances; and of these, strange as it may appear, only four, except in proportions merely accidental, go to the formation of plants. Of those the first is *Carbon*. This forms from 40 to 50 per cent by weight, of the plants cultivated for food; and is therefore most important to animals and to man. The second of these simple substances, is *Oxygen*. The quantities of this substance are immense; and though we are acquainted with it only in the form in which it exists in the air, nearly one-half of the solid crust of the globe, 21 per cent of the atmosphere, eight pounds in every nine of water, and more than one-half of the living bodies of all plants and animals, are oxygen. *Hydrogen* is the third substance peculiar to plants. This is the lightest of known substances, and forms a small part of the weight of all animal and vegetable bodies; constitutes one-ninth part of the weight of water, but enters into the composition of none of the masses that go to form the crust of the globe, coal excepted. The fourth simple substance, entering into the formation of plants, is *Nitrogen*. This forms 79 per cent of the bulk of the atmosphere, constitutes part of most animal and some vegetable substances; is found in coal to the amount of one or two per cent, but does not exist in any other of the mineral masses constituting the crust of the globe. Although not an abundant substance, the importance of it is not the less decided, and some of its functions are of the most indispensable kind. Plants then, are composed of carbon, oxygen, hydrogen, and nitrogen; the first derived from carbonic acid, the second from

the atmosphere, the third from the decomposition of water, and the fourth from ammonia absorbed by water, and taken up by the roots of the vegetables. Some of the earths are occasionally detected in plants, and salts of some kind are always present. In the preparation of manures the principal object to be aimed at, it is evident, must be to supply the materials needed to furnish the carbon and the ammonia: and these are found in the greatest abundance in dead or decomposed animal and vegetable matter.

It seems to be a law of nature, that the higher the grade of the animal, or the more complicated its organization, the greater the necessity of a corresponding degree of orgranization in the substances used as food: indeed the manner in which the crude materials, found in the earth and atmosphere, are worked up by plants, into a state suitable for conversion into the flesh of animals or food for man, exhibits the strongest proofs of benevolent design in the formation of such grades of organized matter. Man can, indeed, live on plants, but his teeth demonstrate that flesh was to constitute no inconsiderable portion of his food. As all animals receive their food, either directly or indirectly, from the vegetable kingdom, it is evident their excrements, or their decomposed bodies, must form manures of the most valuable kind; and it is to this source, the excrements of animals, that the farmer must look for his supply of manures to restore the fertility of the soil. In treating further of manures, we will begin with this, as the most important class.

A late British writer on agriculture, says:—"The chief use of cattle on an arable farm, besides those necessary for the operations of husbandry, is to produce manure for the land. If the cattle repay their food, and the expense and risk attending their keep, the manure is sufficient profit. Even with moderate loss, they must be kept, when manure cannot be purchased. The loss, if any, on the cattle, must be repaid by the increase of the crops. Manure is to a farm, what daily food is to an animal; it must be procured at any sacrifice." Common barn-yard or stable manure is the kind to which most farmers must look for the fertility of their farms. This consists of the droppings of the cattle, mixed with the straw used for littering in stables or thrown into the yards for the animal to feed or lie upon, the coarser hay and weeds refused by the stock, and the urine of the animals kept in the stables or yards. This constantly trampled, is usually kept moist if not wet, and is finally decomposed, or converted into manure fit for the production of crops. This is the most usual course, but it is evident that there must, in this method, be a serious loss to the farmer, of the more valuable properties of the manure. In this way, the decomposition is unequal; a part will be converted into mould while the other will be scarcely acted upon; the salts and the more soluble parts of the excrements, which are the most efficient ones, are dissolved by the rains, and carried off by the drains, or lost in the earth; and where any considerable degree

of heat is envolved, as there will be when the decomposition is rapid, or is going on in large masses, the escape of ammonia, so easily detected by the smell shows that the nitrogen, so essential to the growth and perfection of a grain crop, is rapidly wanting.

To prevent these results, and secure the whole benefit of the manure, two methods have been adopted. The first consists in applying the manure fresh, or in a long state, to the fields it is wished to manure, without waiting for it to decompose. In this way the manure collected in the yards during the winter, is removed in the spring, and applied to such crops as require it the most; and as no fermentation ensues in ordinary cases, until the commencement of hot weather, two sources of loss at least are avoided, those of the washing away of soluble parts, or their being carried off in the shape of gas. Where there exists no necessity for retaining manures for other than spring crops, and where the crops cultivated are such that long manures are suitable for their growth and tilage, this mode of disposing of manures must be considered one of the best that can be adopted. But in many cases the formation of manures in the yards and stables of the farmer is going on the whole year; and preservation in masses, or by being scattered in yards during the hot months, would be to greatly lessen, if not mostly destroy its value. Besides, there are some crops, such as some of the root crops, in the cultivation of which experience has proved fully that rotted or decomposed manure is far preferable to long manure, as much of it is already in a soluable state, and is available to the plants at the time they need hastening the most, which is the period immediately after germination. Where the waste of manure is to be prevented during the summer months, or it is desirable to provide a quantity of fully rotted manure, then the second method should be used; and this indeed, by many excellent farmers, is considered the best in all cases.

In this method, the practice is to remove the dung from the stables and yards at short intervals, and place it in large piles or masses that the proper fermentation may take place previous to its use. When a pile of manure is made in this way, the fermentation takes place in the quantities applied, as they are successively deposited, and therefore does not reach usually that point in which material loss is sustained. If it be found that the heat is becoming too great, or the fermentation injuriously rapid, so as to cause the escape of ammonia, a layer of earth or sods placed over the pile, will retain, by combination, the escaping gases, and thus prevent the loss. It has been found a most excellent plan, one which not only greatly increases the quantity of manures made in this way, but adds to its quality, to mingle with or cover the successive deposites of manure with earth from ditches or ponds, peat or muck from swamps, or turf from bogs or ploughed lands, as such layers, consisting mostly of vegetable or animal matters, will, by absorbing the

drainings of the manure, or the absorption of the escaping gases, be converted into one of the most efficient of fertilizers. The more solid such deposits of manure are made, the more slow will the fermentation be, and hence in unloading, the carts or wagons may be driven over them if necessary to expedite the work, where the immediate use of the manure is not an object. Should the dung placed in these heaps be too slow fermenting, it may be hastened by opening the piles, or still better by making holes in the top, into which the wash of the yards and the urine of the stables may be poured. This method has another advantage.—The manure from the yards, if not wanted as long manure, may be removed to the fields where it is to be used, at times when the men of the farm cannot be otherwise profitably employed, and will be at hand, ready fermented in these piles, when a further transportation might be difficult if not impractible.

(To be Continued.)

EXPERIMENTS IN MANURES.

The following experiments in various manures, will be found interesting. We clip them from the Albany Cultivator's head of Foreign Intelligence.—*American Farmer.*

At the present time there is no subject attracting, deservedly too, more attention than that of the preparation and increase of manures. A large portion of the articles in the May No. of the Farmer's Magazine, are devoted to this subject. It is stated that one ton of straw will make three tons of manure, and that a cow will produce about nine tons of solid manure in the course of the year. In an experiment by Mr. Barton, in Stafford, in the culture of wheat, the increase in the value of the product of an acre, over that of an acre without any manure, was as follows:

1¼ cwt. of guano per acre, - -	$15.32
1¼ cwt. guano and nitrate of soda, in equal parts,	11.84
1¼ cwt. nitrate of soda, - - -	7.13
4 tons caustic lime, - - -	9.49
Lime and salt, mixed, - - -	none.

In several experiments made in Scotland, in raising turnips, the guano appeared to equal advantage in comparison with dung and with bone dust, the latter being the best fertilizer heretofore used for turnips.

Salt and Lime for Grass Lands.

A correspondent of the Mark Lane Express, says that he has "found great benefit from sowing *two* bushels of lime mixed with *one* of salt, at the rate of *twelve* bushels per acre. If more is sown it has a bad effect; in fact, it would destroy rather than improve the

quality of the herbage. I have always found my given quantity very effectual in enriching as well as increasing the quantity."

Bone Dust.

Great quantities of bones are every year shipped from this country to England, to be ground and used as manure, principally for the turnip crop, for which bone dust is found to be the best of all manures. We see it stated that the sum of $50,000 has been paid in a year, by the single district of Strathmore, for bone dust. It is used on dry or calcareous soils, and is considered inefficacious on heavy clay soils.

Charcoal.

A correspondent of the *New Farmer's Journal*, states that during a sojourn in one of the central departments of France, he learned that one of the most productive farms in the neighborhood was originally very sterile; but the proprietor having some years before given it a light dressing of charcoal, from that time it yielded crops exceedingly fine both in quality and quantity. On his return to England, he determined to try the experiment on his own lands, and the results proved highly satisfactory. He says:—"After various experiments I ascertained that before applying the charcoal it should be crushed, when it may be spread over the land like lime, but as soon as possible afterwards it should be well moistened with soft water, by means of a watering cart. The expense per acre, is a mere trifle, in comparison with the permanent improvement effected, which on grass land is truly wonderful. But this is not all. I am quite satisfied that by using charcoal in the way described, *rust in the wheat crop will be effectually prevented*; for I have found that in two adjoining fields, one of which was "coaled," and the other manured with farm-yard dung, the wheat in the latter was greatly injured by rust, whilst that growing in the other was perfectly free from it."

Experiment tried on three years old pasture in Scotland, by Wilson, of Aucheniden, furnished to the Philosophical Society of Glasgow. Two hundred perches were divided into ten lots, of twenty perches each, and treated as follows, yielded the following produce:

Lot 1—	Left untouched,	420 lbs.
2—	2½ barrels of Irish quick lime,	602
3—	4 cwt. lime from gas works,	651
4—	4½ cwt. wood charcoal powder,	665
5—	2 bushels bone dust,	693
6—	18 lbs. nitrate potash,	742
7—	20 lbs. nitrate soda,	784
8—	12½ bolls soot, (equal to 4 bushels)	819
9—	28 lbs. sulphate ammonia,	874
10—	100 gal. ammonia liquor, from gas works, at 5 deg. Tweddle,	945

The value of the applications was 5s. for each lot, or at the rate of £2 per Scotch acre. All the articles were applied on the 16th April, 1841. The grass cut and made into hay in the following July.

Guano.

At a meeting of the Royal Agricultural Society, on the 10th of May, Mr. Davenport communicated the following results of trials made the last year, with guano, on his farm:

"*On Meadow*—One acre sown with 3 cwt. of guano and 3 cwt. of gypsum: crops when ready to stack, 2 tons 18 cwt.

"One acre sown with 2 cwt. of guano and 2 cwt. of gypsum: 2 tons, 8 cwt.

"One acre sown with 2 cwt. of guano only: 2 tons.

"*Turnips.*—One acre of turnips, 4 cwt. of guano, and 4 cwt, of gypsum: 30 tons produce.

"One acre of turnips, 2 cwt. of guano and 2 cwt. of gypsum: 27 tons.

"The difference between an unmanured acre, and one manured with 3 cwt. of guano and the same quantity of gypsum, was 27 cwt. of hay additional.

"The guano was of the best kind, which now sells at 10*l*. the ton. Its effects on green-house plants, when sufficiently diluted, is great, but it is easy to do mischief by excess. Water is the best vehicle. When sown, it should be in showery weather. Altogether, it appears to be the cheapest manure known, and strong soils suit it best."

CHANGE IN SOIL BY GRAIN CROPS.

To discover the nature of the change produced in rich pasture land by a course of grain crops, Mr. Sinclair made the following valuable experiment:

"A space of 2 square yards of rich, ancient pasture land was dug to the depth of 8 inches: 400 grains of this soil, freed from moisture and green vegetable fibres, contained—

Calcareous and silicious sand,	102	*grs.*
Decomposing vegetable matter,	55	
Carbonate of lime (chalk,)	160	
Silica (flint,)	50	
Alumina (clay,)	25	
Oxide of iron,	4	
Soluble vegetable matter and sulphate of lime (gypsum)	4	
	400	

"This toil was then cropped for five seasons alternately, with—1, oats; 2, potatoes; 3, wheat; 4, carrots; 5, wheat. It was then again examined, and appeared to consist of—

Calcareous and silicious sand,	100 *grs.*
Decomposing vegetable matter,	48
Carbonate of lime (chalk,)	159
Silica (flint,)	57
Alumina (clay,)	26
Oxide of iron,	5
Soluble vegetable and saline matter,	3
Loss,	2
	400

Showing a very considerable diminution of the vegetable and animal matters, particularly when it is considered that the turf was incorporated with the soil.—*Farmers Encyclopædia.*

For the convenience of our readers, we will make a table by which, at a glance, may be seen the relative losses and gains of the respective constituents of the soil.

Constituents of the Soil.	*grains.*	*grains.*	*grains loss.*	*grains gain.*
Calcareous and Silicious sand,	102	100	2	
Decomposing vegetable matter,	55	48	7	
Carbonate of lime (chalk,)	160	159	1	
Silica (flint,)	50	57		7
Alumina (clay,)	25	26		1
Oxide of iron,	4	5		1
Soluble vegetable matter and sulphate of lime (gypsum,)	4	3	1	
Loss,		2		
	400	400	11	9

The facts presented by the above table are truly curious, and should induce farther experiments, as it is impossible by any one series of experiments, to test the truth in a way to defy doubt. Here we find that the soil, after five years culture, only lost in specific gravity or weight, *two* grains in *four hundred;* that while there was a loss of 7 grains of the decomposing *vegetable* matter, and one of the soluble vegetable matter and gypsum, there was a loss of but 2 grains of the calcareous sand and but 1 of the carbonate of lime, making in all 3 grains of the calcareous substances; that the Silica or flint gained 7 grains, in volume, and the oxide of iron 1. Whence, it may be naturally asked, did the crops derive their food during the 5 years to which the soil was subjected to culture? It must be very evident, that the 11 grains of lost or abstracted matter could not have supplied the wants of the crops growing during that period, on 2 square yards of land; for though there is an *apparent* loss, it is only *apparent*, as there was also a *gain* of 9 grains, so that the actual loss was but *two* grains as stated in the table; the increase in *flint*, *clay*, and *oxide of iron*, is,

doubtless the result of chemical changes, produced probably by the action of the lime in its different forms on these substances. We are told by the chemists that lime will convert the oxide of iron, or other ferruginous salts, into the sulphate of lime; this may probably be true; and yet, in a soil possessing 40 per cent. of the carbonate of lime, 25½ per cent. of calcareous sand, and 1 per cent. of gypsum, making 66½ per cent. of calcareous principles, we find the oxide of iron *increasing* at the rate of 25 per cent. while the Gypsum *decreased* precisely in the same ratio. We do not pretend to possess even a smattering of Chemical knowledge, and therefore must be excused from expressing our surprise at these results. To us they appear to militate against most of the approved theories, and thus impressed, we should like to see the lights of science irradiated from the minds of *Dana* and *Jackson*, in explanation of this ostensible discrepancy of action. Where, we will repeat, did the crops derive their nourishment from, as it is most evident that the *half* per cent. of loss could not have fed five successive crops?

Does all vegetable products derive their food from the atmosphere exclusively, or in part? If so, what is the peculiar office or agency performed by the earth? [*Amer. Far.*

For the Southern Agriculturist.

RICE PLANTING.

MR. EDITOR,—I beg leave through your pages to make some inquiries of the gentlemen engaged in Rice planting, to some of whom they may be interesting; their practical knowledge must instruct us.

It is generally admitted, that water when in motion, scarcely ever ferments or produces exhalations injurious to health. If so, may not much of the sickness which now occasionally embarrasses your harvests and thrashing, even causing deaths on your plantations, be prevented by ordering the water to be admitted into your ditches, and discharged at least once in twenty-four hours. On most plantations I am told that the water is left to stagnate in the ditches, from the time that it is drawn off for harvest, until the fields are gleaned, and you again flow the fields to sprout the scattered rice, and the seeds from weeds and grass.

I believe it unquestionable, that some fields produce much more to the acre generally, than others in the same neighborhood—that some squares produce more and better grain than the rest, and that parts of the same square,—the margin or borders for instance on both sides of a bank,—produce longer ears and larger grains of rice than the rest of that square. Whatever may be the causes real or

supposed, of certain plantations on the Savannah, Cooper river, and other places, producing more than the general productions of other fields, is it not generally agreed, that the margins produce more than the interior of each square, not from the better nature of the soil, or from greater care or skill in cultivation, but from the annual supplies of manure, received while the fields are flowed and the wind driving the floating stubble, straw and other vegetable matters against the banks. If manure then, is unquestionably beneficial to some parts of a rice-field, why may not all the parts be rendered by manuring, equally or more productive than the margins? Why may not all the rice-fields in the State be improved in their productions, and those which now yield 60 or 70 bushels to the acre be brought, by judicious management, to yield 80 or 90 bushels. The excellent, observing and judicious planters, who inspect their fields on the Winyaw, Santee and other places, by spending their summers in the vicinities, have great opportunities for making experiments, inspecting their progress, and testing the results, with little or no trouble, cost or risk. All rice-fields have an immense quantity of stubble left in them after harvest; if the insignificant remnants of that stubble floating up to the margins, produce such decided benefits, why may not the mass of it be turned into the soil, or be mixed with something by which it might be fermented, or be mixed with lime, and thus more readily become vegetable nutriment. Some such experiments on a few squares every year, would heighten the interest felt by a planter in his occasional visits to his fields, and probably add much to his profits.

Nature appears to have pointed out one means of preserving and increasing the strength of rice-fields on tide-lands. Every flowing of your fields, if left on them only a day or two, will leave a consi derable deposit of mud, probably mixed with a little lime or salt, and add to the productions of your crop. May not art imitate nature and improve upon the lessons received from her. If the Savannah and Cooper river lands are supposed to be enriched by the muddy, brackish water, which occasionally overflows them—may not the fine fields on the Pee Dee, Waccamaw, and other places, not visited by the salts, be made artificially richer by similar means —the experiment being first tried on a few acres, that nothing may be risked. On these rivers, and most others above the flow of salt

doubtless the result of chemical changes, produced probably by the action of the lime in its different forms on these substances. We are told by the chemists that lime will convert the oxide of iron, or other ferruginous salts, into the sulphate of lime; this may probably be true; and yet, in a soil possessing 40 per cent. of the carbonate of lime, 25½ per cent. of calcareous sand, and 1 per cent. of gypsum, making 66½ per cent. of calcareous principles, we find the oxide of iron *increasing* at the rate of 25 per cent. while the Gypsum *decreased* precisely in the same ratio. We do not pretend to possess even a smattering of Chemical knowledge, and therefore must be excused from expressing our surprise at these results. To us they appear to militate against most of the approved theories, and thus impressed, we should like to see the lights of science irradiated from the minds of *Dana* and *Jackson*, in explanation of this ostensible discrepancy of action. Where, we will repeat, did the crops derive their nourishment from, as it is most evident that the *half* per cent. of loss could not have fed five successive crops?

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MR. EDITOR,—I beg leave through your pages to make some inquiries of the gentlemen engaged in Rice planting, to some of whom they may be interesting; their practical knowledge must instruct us.

It is generally admitted, that water when in motion, scarcely ever ferments or produces exhalations injurious to health. If so, may not much of the sickness which now occasionally embarrasses your harvests and thrashing, even causing deaths on your plantations, be prevented by ordering the water to be admitted into your ditches, and discharged at least once in twenty-four hours. On most plantations I am told that the water is left to stagnate in the ditches, from the time that it is drawn off for harvest, until the fields are gleaned, and you again flow the fields to sprout the scattered rice, and the seeds from weeds and grass.

I believe it unquestionable, that some fields produce much more to the acre generally, than others in the same neighborhood—that some squares produce more and better grain than the rest, and that parts of the same square,—the margin or borders for instance on both sides of a bank,—produce longer ears and larger grains of rice than the rest of that square. Whatever may be the causes real or

supposed, of certain plantations on the Savannah, Cooper river, and other places, producing more than the general productions of other fields, is it not generally agreed, that the margins produce more than the interior of each square, not from the better nature of the soil, or from greater care or skill in cultivation, but from the annual supplies of manure, received while the fields are flowed and the wind driving the floating stubble, straw and other vegetable matters against the banks. If manure then, is unquestionably beneficial to some parts of a rice-field, why may not all the parts be rendered by manuring, equally or more productive than the margins? Why may not all the rice-fields in the State be improved in their productions, and those which now yield 60 or 70 bushels to the acre be brought, by judicious management, to yield 80 or 90 bushels. The excellent, observing and judicious planters, who inspect their fields on the Winyaw, Santee and other places, by spending their summers in the vicinities, have great opportunities for making experiments, inspecting their progress, and testing the results, with little or no trouble, cost or risk. All rice-fields have an immense quantity of stubble left in them after harvest; if the insignificant remnants of that stubble floating up to the margins, produce such decided benefits, why may not the mass of it be turned into the soil, or be mixed with something by which it might be fermented, or be mixed with lime, and thus more readily become vegetable nutriment. Some such experiments on a few squares every year, would heighten the interest felt by a planter in his occasional visits to his fields, and probably add much to his profits.

Nature appears to have pointed out one means of preserving and increasing the strength of rice-fields on tide-lands. Every flowing of your fields, if left on them only a day or two, will leave a consi derable deposit of mud, probably mixed with a little lime or salt, and add to the productions of your crop. May not art imitate nature and improve upon the lessons received from her. If the Savannah and Cooper river lands are supposed to be enriched by the muddy, brackish water, which occasionally overflows them—may not the fine fields on the Pee Dee, Waccamaw, and other places, not visited by the salts, be made artificially richer by similar means —the experiment being first tried on a few acres, that nothing may be risked. On these rivers, and most others above the flow of salt

water, they have freshets, and the water being then very turbed, would leave a very deep deposit of the finest manure. May not the fields be rendered much more susceptible of benefit from all such overflowings, by having the stubble turned under early in the winter, by ploughing with oxen, or by any other means, so that the alluvial deposite may better intermix with the soil, and rot the stubble, instead of destroying it by fire? If any planters can plough their rice-fields with oxen, why may not all do it, and thus cultivate more acres to each hand and improve the crop?

When the scattered grains have been sprouted to prevent red rice, and the birds gleaning the remnant, have had fair access to the fields, and they have become dry in the winter, what can prevent the planter from having the stubble turned to some account in manuring the rice-land? Why may not some trials be made, even with a few squares, on each plantation—beginning this winter and continuing his trials and experiments during succeeding winters, until he is satisfied either of its benefits or its failure? Would not the stubble rot much more thoroughly and rapidly, turned under the surface, than when left dry in the open air, or covered with water from the influence of the atmosphere? If the margins or borders are fertilized by floating particles of this stubble, how much more would it do so when turned under to rot all the winter? Providence appears to point out this plan, as one among others, for improving the soil, and affords the means for doing so. The spring-tides which occur at the full and new moon, enable the planter to flow his fields with muddy water, and when this becomes clear by standing a day or two, it can be run off with ease. The water should be made as muddy as possible when overflowing the field, and if the mud in the ditches be well stirred on these occasions, the field will not only be fertilized, but much trouble and exposure saved, in cleaning the ditches as often as is now requisite. In fields and parts of fields, where the soil is light and spongy from the undecayed roots of rushes, &c., would not the frequent deposits from such muddy flowings be peculiarly strengthing and fertilizing.

If these inquiries and observations attract the attention of your many experienced readers, I hope that some of them may give us the results of their observations, and direct others in what may be done or avoided. B.

CULTIVATION OF RICE.

Natchez, March 25, 1343.

Mr. Allen, Dear Sir:—

In answer to your inquiries about rice and the comparative product of what is called *upland* and *lowland*, I can not give you much information. What little I have is at your service. Together with many others, you seem to have taken for granted, that there is a variety of rice adapted to upland cultivation, and another to lowland. Certainly there are many varieties of rice; but I am induced to believe that they are all essentially aquatic. All the varieties, yet discovered, flourish best under the inundation system of culture; yield more to the acre, give less trouble, and require less labor. Nevertheless, each variety grows pretty well on light, moist uplands, without irrigation, when cultivated with the hoe or plough. The product, however, is so much less than that by the irrigation system, and the labor of tillage so much more, that the upland producer never can compete successfully with the lowlander. The former may curtail expenses by growing rice for domestic uses, but he cannot, very profitably, produce it for sale.—Besides the ten-fold labor, which rice on uplands requires, in comparison to that cultivated by the irrigation system, it cannot be sown thick enough to make a larger yield per acre. Space must be left for the plough or hoe to till the rice, which is not necessary in those localities where it can be overflowed at will, and the water drawn off as occasion may require.

The method pursued on the rice-lands of the lower Mississippi, is to sow the rice broadcast, about as thick as you sow wheat at the North, and harrow it in with a light harrow having many teeth; the ground being first well ploughed and prepared by ditches and embankments for inundation at will. It is generally sown in March. Immediately after sowing, the water is let on, so as barely to overflow the ground. The water is withdrawn on the second, third, or fourth day, or as soon as the grain begins to swell. The rice very soon after comes up and grows finely. When it has attained about three inches in height, the water is again let on; the top leaves being left a little above the water. Complete immersion would kill the plant. A fortnight previous to harvest, the water is drawn off to give the stalks strength, and to dry the ground for the convenience of the reapers.

A different method is practised in the northern part of Italy. The seed is sown in April; previously to which it is soaked a day or two in water. After sowing, about two inches of water is let in upon the ground. The rice comes up through the water, which is then drawn off to give the plant strength, and after some days, is again let on. The rice is more apt to mildew under this practice, than our method of letting the water on about the time the Italians draw it off. Mr. Jefferson, in his memoranda of a journey into the

northern part of Italy in 1787, published in 2d vol. of his correspondence, says, that in the neighborhood of Milan, "they first plough the ground, then level it with a drag-harrow, and let on the water, when the earth has become soft, they smooth it with a shovel under the water, and then sow the rice *in the water*." The same measure of ground yields three times as much rice as wheat. The only labor, after sowing, is to see that the rice is properly irrigated, except in some localities where aquatic plants prove troublesome, the water effectually destroying all others.

The rice-grounds of the lower Mississippi produce about seventy-five dollars worth of rice per acre. The variety called the Creole white rice is considered to be the best. In the eastern part of the State of Mississippi, called the "*piney woods*," rice is very generally cultivated on the uplands. Although it cannot be made a profitable article of export, yet it affords the people of that interior region an abundant supply of a healthy and nutritious food for themselves, and a good provender for their cattle, and makes them independent of the foreign market. Unlike other kinds of grain, it can be kept for many years without spoiling, in a warm climate, by simply winnowing it semi-annually, which prevents the weevil and a small black insect that sometimes attacks it. It is cultivated entirely with the plough, and grows well on the pine barrens. A bull-tongued plough, a kind of shovel-plough drawn by one horse, is driven through the unbroken pine-forest; not a tree being cut or belted, and no grubbing being necessary, as there is little or no undergrowth. The plough makes a shallow furrow about an inch or two deep, the furrows about three feet apart. The rice is dropped into them and covered with a harrow. The middles, or spaces between the furrows, are not broke up until the rice attains several inches in height. One or two ploughings suffice in the piney woods for its cultivation—weeds and grass, owing to the nature of the soil, not being troublesome. A similar method of cultivation obtains on the prairie land of the Northwestern States.

Rice, like hemp, does not impoverish the soil. On the contrary, it is a good preparatory crop for some others, as Indian corn. The pine barrens of Mississippi would produce rice ad infinitum, if it were not that the land, after a few years, owing to the sandy nature of the soil, becomes too dry for it. It has been ascertained by Arnal, that 12 pounds of wheat-flour and 2 pounds of rice will make 24 pounds of excellent bread, very white and good; whereas, without the addition of rice, 14 pounds of flour will only make 18 pounds of bread. Like other kinds of grain, rice adapts itself to the soil and climate, and particular mode of cultivation; but if the seed be not changed, or selected from the best specimens of the plant, it will ultimately degenerate. Thus in Piedmont, after a long series of years, the rice became so much affected with a kind of blight called the *brusone*, as to compel the Piedmontese to import fresh seed in 1829, from South-Carolina. When Mr. Jefferson

visited Piedmont in 1787, the exportation of seed-rice or rice in the husk was punished with death. The American rice introduced into Piedmont escaped the *brusone*, but it was some years before it adapted itself to the soil and climate. Some years ago, a French traveller by the name of Poivre, finding rice growing in great perfection on the mountains and high lands of Asia, particularly Cochin China, named it "*riz sec*" or dry rice, and sent the seed to Europe, where many experiments were made with it. It yielded no better than any other kind of rice, and was found like all others to succeed best when inundated. The reason why it yielded so much more in Asia than in Europe, can be readily accounted for, by the natural inundations it received from the excessive rains during the monsoons.

The discovery of a dry or upland species of rice, was for a long time a desideratum to the European agriculturist; because both France and Spain interdicted the cultivation by inundation on account of its supposed insalubrity. But no variety has been discovered which yields as much out of the water as it does in it. There are many localities in the United States, where the culture of rice by the irrigating system, would rather serve to make the surrounding neighborhoods healthy instead of sickly. It is generally admitted, that a given surface of ground completely inundated, is much less unhealthy than the same surface partially inundated, or *in transitu* between the wet and the dry state. Hence, mill-ponds which partially dry up in the summer, are fruitful sources of disease. Some of the best rice is said to grow on the bottom of mill-ponds. Nothing more is necessary, than to make the bottom of the mill-pond perfectly level, and then to overflow the whole surface just deep enough to keep the top leaves above water. As if to show, that unhealthfulness is not necessarily connected with the culture of this valuable grain, nature has imposed a law upon it, ordering that it should flourish better when overflowed with pure running water than with the stagnant waters of impure lakes and marshes. If the mathematician with his leveling instrument were called to the aid of the agriculturist, it would be a very easy matter, in many localities, to mark out the course and required depth of those drains, which would give motion to stagnant waters, and convert many unhealthy and impenetrable bogs and marshes into fruitful rice-fields.

The progress of agriculture is very much impeded by error and confusion in names, which can never be corrected until the botanist comes to its aid. Thus, on the Rhine I met with a species of spring-wheat, the *triticum monococcum*, cultivated under the name of *riz sec* or dry rice. This kind of wheat is particularly adapted to cold, mountainous regions, with a poor silicious soil, and well deserves the attention of the American people, not as rice, but as wheat. In Alsace it is called "*epeautre de mars*," or rather "*la petite epeautre*," to distinguish it from the *triticum amylcum*. There

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are two kinds of rice, which are said to succeed best on uplands; the long and the round. The former has a red chaff, and is very difficult to be beat. The latter shakes out, if not cut as soon as ripe. They nevertheless succeed best under the inundation system of culture. In the eastern hemisphere, rice is cultivated as far north as the 46th degree of latitude. The climate of the United States is better suited to it than that of Europe, because our summers are hotter. In the northern parts of China, the variety called the imperial rice, or *riz sec de la Chine* (the *oriza sativa mutica*,) is more precocious than any other, is said to yield a heavy harvest, and to constitute the principal food for the people of that populous region. But it has succeeded no better in Europe than any other kind of rice.

The best rice-lands of South-Carolina, are valued at five hundred dollars per acre, while the best cotton-lands sell for a tenth part of that sum, proving that rice is more profitable than cotton. The profits of a crop should not so much be estimated by the yield per acre, as the number of acres a laborer can till. After the land is properly prepared for inundation, by leveling, ditching, and embankments, a single individual can grow almost an indefinite quantity of rice. Rice is no doubt ultimately destined to supersede cotton in a large portion of Mississippi and Louisiana. There is a body of the richest alluvial land in the world, lying in the southern part of this county, Adams, and the adjoining county of Wilkinson, not forty miles from Natchez, containing upwards of one hundred thousand acres; many entire sections of it, at this very day, belonging to the United States government, and subject to entry, and the balance, including the improvements, not valued at more than from ten to fifty dollars per acre, which at very little expense could be converted into the most productive rice estates. There is a large lake, called Old River, of some twenty miles in length, by a mile in width, forming the boundary between Adams and Wilkinson counties. This lake, by an embankment two hundred yards in length, could be cut off entirely from the Mississippi river, and would serve as a reservoir to receive the water from the rice plantations, while the waters of the Homochitta river could be made, at all times, to overflow the rice-fields. On the coast, near New-Orleans, the water of the Mississippi itself, is conducted through ditches to overflow the rice-grounds. But as the banks have only a very gentle slope backward, the water has to be conducted a mile or more, unless the river be very full, before it arrives at land sufficiently low to inundate. Farther backward the swamps set in; thus limiting the rice-lands to a narrow strip behind the cotton and sugar-lands, and in front of the swamps. But in the region of country just referred to, the Homochitta river coming down from the hills could be made to overflow the Mississippi bottoms up to the levee, on the margin of the great river itself. The lake just mentioned would at all times, afford an ample reservoir for the

effete waters from the rice estates. It is true, that a large portion of the Homochitta river falls into the lake, but it is equally true that a dam, not much exceeding a common mill-dam, would turn the Homochitta in another direction, viz: into Buffalo river, about half a mile distant, through a natural canal or bayou. The banks of the Homochitta, from the place designated for the dam, to its present mouth, a distance of fifteen miles, occupy a higher level than the Mississippi bottoms; thus affording every facility for irrigation with very little expense or labor.

Lake Concordia, a similar lake in extent, lying a few miles west of Natchez, had lately had its communications with the Mississippi river closed by artificial embankments, called *levees* in this country. The consequence is, that at the moment I now write, the water in the Mississippi river is some fifteen feet higher than the water in Lake Concordia. When the Mississippi overflows its banks, I have never less than ten feet bank at my plantation, the lowest ground on Lake Concordia. The lands on Lake Concordia cannot, however, as you might suppose, be converted into rice plantations by conducting the water from the Mississippi river, because it is only when the Mississippi is very full, that they could be inundated at all, and then only partially. But if there were in the vicinity ofLake Concordia an inland stream, like the Homochitta, tumbling from the hills, you can readily perceive how easy it would be to inundate them at pleasure, and drain the water into the lakes. I mention the section of country in Adams and Wilkinson counties, not because it is the only one favorably situated for the culture of that most profitable and useful grain, rice, but merely to answer your inquiries in part, by giving you a glimpse of some of the agricultural resources of this section of country, which can not be understood without some allusion to its topography. However good a handmaid chemistry may be to the farmer or planter, he should not be taught to expect too much from it, to the neglect of agricultural topography. It is the science of agricultural topography which lies at the root of those wonderful improvements that have made the Lombardo-Venetian kingdom rival, and even excel, England in agriculture. But I have not time, at present, to answer your inquiries in regard to the system of irrigation so successfully practised in the north of Italy.

Very respectfully, your obedient servant,

SAMUEL A. CARTWRIGHT.

[*S. W. Farmer.*

Mr. Scott, of South-Carolina, has succeeded in engrafting the lilac on the ash; this is done in France with perfect success, and nothing can be more beautiful than the drooping ash, hung with the elegant flowers of the lilac.

IMPROVED CULTURE OF COTTON.

To the Editors of the Southern Cultivator:—

MESSRS. EDITORS.—In looking over the 2nd No. of your very neat and most excellent Southern Cultivator, a few days since, I observed an extract from a paper of mine, "upon the Improved Culture of Cotton," taken from the Albany Cultivator, of February last.* At your permission, gentlemen, I avail myself of the earliest leisure moment from the duties of my profession, to correct a most erroneous impression, which I conceive that extract, on its present isolated position, is calculated to make upon the minds of your numerous readers. That extract, embracing as it does simply the modus operandi of the system of culture by which my cotton was grown the last year, which, together with the caption —"*How to make a large Cotton Crop*"—placed this improvement, and my object in the time, labor and trouble sacrificed in its accomplished, in rather a ridiculous light before the sober and reflecting planter. Such planters, and their influence is beginning to be felt in our country, are disposed to look upon and hail the appearance of the Southern Cultivator, as the harbinger of better days than those of the *multicaulis, multibolis, and fancy stock humbug*, the pestiferous influence of which has swept over our land like an Egyptian blight. Such men are the patrons of light and knowledge in agriculture, they reason from cause to effect; give them the truth, the simple and whole truth, with all the conditions of any improvement, and they act upon the impulse of a wise and proper reflection. Their primary object is improvement, their views are liberal, and their motives patriotic. Thus in the exercise of a purely unsophisticated judgment, in determining the merits of a great national agricultural improvement, however brilliant the success in the end accomplished. They coolly and dispassionately take up the premises, and if they discover there a deep laid and broad basis, sufficiently immoveable to sustain the superstructure, though infinitely beyond the ken of even previous imagination, they will accord to it a most cordial approval. There is a presumptive evidence, at least, which the mind of the honest and generous hearted planter recognizes in the fact, that science is the governing principle here, the improvements of which upon the destiny of man, within the last half century, have accomplished more than all the *brute force* of the previous fifty centuries of the world's age.

Do not suppose me, gentlemen, ambitious to secure the precipitate credulity of a single planter, in the advantages of this improvement; all that is asked for it is, an *attentive* and *patient hearing* and a *fair trial:* to such planter reward is certain, and to

* The above pieces will be found in the Numbers for January and April, of the Southern Agriculturist, of the present volume, pages 15 and 147, nearly entire, but not with the caption alluded to.

such only. In collecting and grouping together these leading principles in the science of agriculture, so prominently and admirably held forth by Davy, Liebig, and the Cultivator, (Albany,) and in adjusting them to the economy and great ability of the cotton plant, let me assure you, gentlemen, I have been actuated by a higher and a holier motive than the sordid object, in the abstract, of "a large cotton crop!" This is certainly the result, and, in part, the planter's reward, which, however, I have ever regarded as the least interesting feature of the improvement. In its proper place, in my first paper, you may observe, that my object in these experiments has not been to augment the crop of cotton, either per hand or per the aggregate, already too great, but by an entirely new and improved system of culture, predicated upon the principles of a scientific and enlightened policy, to curtail the immense capital engaged, under the destructive system of the country, in its production, to one-third its present enormity. If I shall succeed in demonstrating this fact, my determined object, which my experiments the past season have more than realised, I shall have accomplished yet another step in this interesting improvement, and that not the most important.

Again, gentlemen, you will not fail to observe, nor will the merest tyro in the profession of agriculture, that the land thus treated, (as per detailed,) after yielding the handsome reward to the industry, care and perseverance of the planter, of some 3,000 to 5,000 pounds of a superior staple per acre, will be improved by the operation in the ratio of some two or three hundred per cent. upon its natural state. The soil thus improved, the primary object of the system will be found the next year, superiorly adapted to the culture of corn; requiring simply the surplus cotton seed of the previous crop, with the same treatment otherwise, to insure a yield of 50 to 75 bushels per acre. The treatment of the succeeding two years, first in small grain, giving an equally large yield, and last, which complete the cycles of rotation, to lie one season in the state of tallow, will each add greatly to the improvement of the soil. I have neither time nor space at present to enter more minutely into this most interesting branch of the subject, which sketch, however, will serve to illustrate my object in the institution of these experiments.

A short reply to your editorial commendation and I have done. It has not appeared surprising to me, gentlemen, that the result of my experiments should "seem extravagant" to you in your office, when I have seen planters, men too of experience and extended observation, from Baker County in your own State, and others from the rich alluvial valleys of the Chattahoochee, and the great Mississippi, while standing in the midst of my cotton, to express even greater reluctance in according their assent, though looking upon the well proportioned weed, yielding its thousands per acre. An optic entertainment this, infinitely more interesting

than the rapids of Harper's Ferry, or their counterpart, Jefferson's Rock, which that great man declared to be worth a voyage across the Atlantic. N. B. CLOUD, M. D.

Alabama, July 15th, 1843.

P. S.—You will probably be told, gentlemen, by some ad captandum planters, whose speculative temperaments have induced them to grasp at the "golden fleece" with impure hands, "that they have tried this system and it will not answer." Ask such men if they have complied with the condition, and believe them not. I will here, in a very few words, inform you, and the friends of improvement, that I have cotton now growing upon pine land, a fair experiment, the present very unfavorable season, treated precisely to the letter as detailed in No. 2, that was topped on the 10th inst. six feet high, and so entirely interlocked the wide way as to forbid the further use of the horse hoe or sweep. Upon a single stalk of this cotton, and it not better than others around it, I counted on the same day, (10th,) upwards of 300 bolls, blooms and squares—they literally hang upon the limbs in tresses—and this cotton has yet 75 days to mature. Think you the same success may not be attained in Carolina and Georgia? I tell you that the ingenuity and industry of the American farmer's sons, attained by the stern maxim of Roman perseverance, "Nil desperandum, possent quia passe videntue," may, under this system, grow the same cotton and corn upon the poor, piney barrens of Edgefield and Richland. [*So. Cultivator.*

EXPERIMENTS IN MAKING SUGAR FROM CORN-STALKS.

The following, taken from the minutes of the transactions of the French Academy of Science, we copy from the American Farmer. It will be read with deep interest.

"At the sittings of this body in September last, a series of reports and researches was submitted by M. M. Biot and Soubeiran, on the subject of making sugar from Indian corn. It seems that, as far back as 1834, M. Pallas placed before the Academy, an account of his having extracted two per cent. of sugar—entirely like that of the sugar-cane—from the stalk of the maize. M. Robiquet again reported upon Pallas's communication, suggesting that the greatest yield of sugar could probably be obtained immediately after the flowering of the plant, and that its quantity would be greatly lessened when the grain began to be completely formed. In 1839, M. Pallas again communicated experiments as to the effect, on the saccharine qualities of maize, of removing the ear at several stages of its growth. Upon this paper Messrs. Bouissingault and Biot again reported, pointing out the defects of M. Pallas's experiments, and indicating the proper method of investigating the matter.

"We give this little sketch of the progress of this conversion of of maize to the purpose of furnishing sugar, as interesting to those who, in this country, are prosecuting the same object. Monsieur Biot's last paper is to the following effect:

"'The stalks upon which they operated, were taken from the Jardin des Plantes. Some of them had been separated from their heads; others had not. They report that the sugar of maize is precisely that of the sugar-cane, mixed, however, with a small quantity of sugar of fecula. The juice of the maize, which had been castrated, contained per litre, 113 grammes, or 12 per cent. of sugar; that of the non-castrated, gave 124 grammes, or 13 per cent.—These experiments prove that castration is rather injurious than otherwise, and that if maize is to be used for this purpose of extracting its sugar, it must be in its normal state. Whether this new industry on an extensive scale, would be a profitable one, is a question which, at the present moment, may be matter of dispute; but there is one consideration in its favor, supposing the productiveness of the maize to be such, if cultivated to the necessary extent, as to render the cultivation of the beet-root unnecessary. The latter must remain on the ground during the whole of the summer, and the moment of harvest is too near that of the winter-sowing for corn, to leave time to prepare the ground for receiving the new seed. Maize, on the contrary, runs through all the phases of vegetation in a few months, and it can be gathered in, as it is not necessary to leave it on the ground until it has attained to full maturity, and sufficiently early to have abundant time to prepare the ground for the winter corn-seed. M. Thenard, one of the members of the Academy, alluding to that part of the report of Messrs. Biot and Soubeiran, in which it ts stated that there is a small quantity of sugar of fecula, mixed with the cane sugar of the maize, observed that the beet-root contains crystallizable sugar, unmixed with sugar of fecula, and that probably the presence of the latter in the experiments made on maize, was due to the mode of manipulation, and that it does not exist naturally in the plant."

BONE DUST, &c.

Some two years since, I became thoroughly convinced of the great value of bone manure, so much so, that I only wished to know the best mode of applying it, and then would purchase no other. I also wished to know whether the ground bones, or the sawings and turnings of the button makers, were the best; accordingly, I bought from three different persons, as many kinds, at 16 to 45 cents per bushel, near 300 bushels, which I applied from the 1st of Fourth month, until the latter part of Eighth month, at the rate of 10 to 40 or 45 bushels per acre, on orchard grass sod, timothy, and clover of the first. second, and third years' growth;

on wheat and turnips broad-cast; and on potatoes, corn, pumpkins, peas, beans, onions, celery, radishes, strawberries, and other things in the hill and drill; and have anxiously waited ever since, without saying, and for obvious reasons not wishing to say, anything against it; but have now come to the conclusion, that the same bulk of good stable manure would have done more good to the crops and the land; for I cannot even now, see any difference in the appearance of the present crops of grass, where it was sown last year on the wheat, and on other different pieces of grass. It is certainly not a profitable manure for my farm, either on the clay, loam, or sandy part; what the reason is, I leave for wiser heads to determine. My principal reason for making the present communication, is to caution others from going quite so deeply into it at first, as I did, but try a smaller quantity, and in the meantime, let the bones go to England, or to those whose soil they may suit.

I find that glue dung is the cheapest manure I can purchase; my manner of using it is to mix and ferment it with stable manure, in the proportion of about one-third of glue dung with two-thirds of other manure, and turn it over twice, then apply it in the usual way. Spent, or soapers ashes, I have also used with very good success; harrowed in with oats, clover and timothy, on a loamy clay—four two-horse wagon loads per acre.

I am quite disappointed this spring, in my observations as to the manner in which the cut-worm makes its appearance in the corn. I always supposed the egg was deposited in the ground, and remained there during the winter, and from which the worm was produced in the spring, in time to make its ravages on the corn. My corn field this year, was a stiff sod of blue grass and timothy, and I expected the worms would be bad in it; accordingly I commenced searching for them as soon as the corn was fairly up, and found them in many cases completely covered, except at top, in a web or cocoon, immediately by and attached to the corn, just under the surface of the ground; I have destroyed hundreds of them found in this way, which proves to my mind, that the eggs must have been deposited there only a few days before. There are various things recommended to prevent them from injuring our grain, but I have found the Frenchman's plan most successful, as recommended to destroy fleas; "first catch them." The proposal to plant onions in the hills with the cucumbers, to prevent the striped bug from attacking them, has with me, proved a total failure, as most of the hills have been destroyed, either wholy, or in part.

S. S.

[*Farmers' Cabinet.*

The Chinese make candles of a substance procured from the Tallow Tree. They cultivate it for its wax or tallow. It grows large and handsome, and is covered with pale colored flowers. It is called Lat-choo.

THE SILK CULTURE.

At length we have something novel in the way of silk culture. A Mr. Gill, of Ohio, has patented a process and apparatus, that appear likely to render much more secure, if not certain, the labors of the cocoonery during the last stages of operation; the failures attendant upon which, have been found so ruinous heretofore. His plan is, to feed the worms after their second moulting, in tents; to *fan* them when the weather is unhealthy, and to *rock them in cradles.* The account published by Mr. Gill is so curious, and withal so natural, that I am desirous to see it preserved in the pages of the Cabinet. He says:—"My operations in feeding and manufacturing during the last year, have furnished employment for about fifty hands on an average; and I have manufactured in that time, upwards of $9,000 worth of silk goods, consisting of all the varieties of staple silk in demand, equal to any imported; and sold them readily at a reasonable advance on their cost of production and manufacture; and my efforts have been crowned with complete success. In the past five years of my operations, I have frequently met with failures, and occasionally entire loss of worms from extremely warm, close and confined weather, *but never from cold.* I have tried all the plans of feeding and ventilating used or known in the United States, but found them all deficient in accomplishing the object desired; but by studying the subject—the nature, habits and wants of the worms, I have been enabled to adopt a plan which meets every important object. I shall feed very extensively on it the coming season, and fully believe that my invention will work as complete a revolution in the growing of silk, as the discovery of the gin has in that of cotton. I have named my invention, 'Gill's Patent Feeding Tent, and Silkworm Ventilating Cradle.'

"These tents and cradles may be constructed of any size, and of any materials suitable, keeping in view the principles of construction. I adopt, as a convenient size, a tent 15 feet wide, and 50 feet long; side posts, four feet apart, driven into the ground, and standing six feet above it, each side: for centre posts, eight feet apart, driven into the ground, and standing eight feet above it, which gives two feet pitch to the roof. The ridge and eavespoles to be fastened along the tops of each of these three ranges of posts. The tent cloth to be of linen, or any other fabric suitable, and impregnated with paint, tar, &c., if desired. The linen covering is most convenient in breadths of 10 feet; to extend from the bottom on one side, over the top or ridge of the building, and down to the bottom on the other side, with weightpoles or rollers, at the bottom on each side, so that the tent cloth may be rolled up to any height, to give free circulation of air, or exclude it, with rain or sunshine, at pleasure. The rollers of cloth should, when down, reach to within six inches of the ground, with a drain under them, to carry off the water: the ground forming the floor.

"The feeding ventilating cradles are constructed to embrace the following principles, and of sizes to suit the breadth of the tents, leaving an aisle along the centre of the room, and between each cradle. To furnish a tent 15 feet wide, the cradles should be 12 feet long, and have three rockers four feet long, made of plank 15 to 18 inches broad, and about one and a half inch thick; with a trough resting across their centres, let in by a notch in the rockers, 12 feet long, one foot wide, and one end closed. From the points of the rockers attach upright posts, 30 inches long, inclining outwards, and a cap attached to their tops on each side, parallel with the trough. To this cap and side of trough, attach laths one-eighth of an inch apart, the whole length of the trough on both sides, so as to form when finished, a rack about two and a half feet deep and five feet wide at the top; and across the trough fasten slats about one foot apart, on which to lay the mulberry branches, and on these branches put the worms, after their second moulting, or when about half grown, and feed them until they spin, with branches with their leaves on, cut about one foot long. Suspended over each cradle, is a fan made of bonnet-boards, or any other thing suitable, with a pendulum, coming down from the shaft which is across the tent in two of the upright posts; this pendulum, the person who attends the feeding, can put in motion, which also rocks the cradle; thereby removing all impure air about the worms, and shaking down the dry leaves, litter and excrements into the trough, into which a bucket of water is occasionally poured at the upper end, and all is washed out at the lower or open end, leaving it pure and clean. The motion of the cradle is agreeable to the silk-worm, approximating to the waving of the branches while feeding on the trees in a state of nature. Another important advantage is, that no worms can fall through to the ground, and those that happen to fall down in the brush, crawl to the lath sides, and mount easily to the top. They also readily spin among the clean, bare brush, making but little floss, and seldom double cocoons. A fender made of tin, or any other suitable material, is affixed to the rockers, that prevents mice, ants, and other insects from ascending to the worms. The plan throughout is simple, cheap, and easy of application; it curtails the expenses more than one half, and more than doubles the quantity and quality of silk from a given quantity of eggs."

The plan appears feasible and easy of adoption. At first there would appear a danger of the tents suffering damage from the effects of storms, but their use would be confined to a short space of time; as it is to be understood, I presume, that the worms are to be reared to half their growth in other buildings, and be transferred to the cradles, there to remain until they spin; when, at the end of the season, the tents could be taken down and packed carefully away for another year; this is no doubt an economical plan, the re-erection of a tent being the labor of an hour or two

only; and a situation might be chosen most convenient to the business, perhaps in the plantation, to save the labor of carrying the branches to a distance. It is calculated, that a tent 50 feet long by 15 feet wide, would contain six cradles of 12 feet in length, and that each cradle would feed 15,000 worms. Mr. Gill proposes to dispose of individual rights for three bushels of merchantable cocoons, or ten dollars cash.

J. C.

[*Farmers' Cabinet.*

Remarks.—Mr. Gill's statements as to matters of fact, are entitled to implicit credit. He is a large owner of silk, feeding from more than 30 acres of trees. He is also becoming largely interested as a manufacturer of silk. He has, therefore, the greatest possible interest in adopting himself, and establishing through the country, the *best mode of feeding*. Besides, his high character puts all skepticism as to his statements out of the question.

For two years I have been collecting and publishing facts, all going to establish the great principle on which Mr. Gill's plan is based, viz., *open feeding*, giving your worm's heaven's pure air, and all of it. *This is nature.* The worm in its native state, feeds in open air, on the tree, exposed to all the changes of temperature like the caterpillar, the canker-worm, and other annular insects. In this state it was found upon the high hills of China, 700 years before the birth of Abraham. In this state it has been found in this country, at least in Maine, South-Carolina, and on Mount Holyoke, Massachusetts, 1,000 feet above the level of the Connecticut river.

I repeat the facts already extensively published. *The Chinese feed in open sheds*, and the climate of China, in the same parallel of latitude, is essentially the same as our own.

Six years' experience, and quite an extended correspondence have fully satisfied me that we have much more to dread from *heat* than from *cold*. Hot sultry weather, with no air stirring, is always bad, and in inclosed buildings, with large lots of worms nearly ready to spin, is almost certainly fatal. Hence the advantage of an open shed or tent, and the still further benefit of a local circulation of the air as secured by Mr. Gill's simple contrivance—the cradle and fan.

The expense of such a tent must be small. At the sail-lofts in our sea-ports, sails too much worn to be used on vessels, can be got cheap. Cotton drillings and negro sheetings, or Lowell osnaburgs, each about 30 inches wide, can be got for 7 or 8 cents by the quantity. A cradle, as described, would take 60 feet of common lumber, board measure, and a carpenter can make one, rough planed, in a day, or a day and a half. A tent 50 by 15 feet would accommodate six cradles 12 feet in length. Each cradle will feed, I think, 15,000 worms; say 75,000 to 85,000 for the tent.

I take it to be essential to this system that the eggs be hatched, and the worms be fed from the *first* in a perfectly natural state of

the atmosphere, that is, hatch and feed them in an open room until your worms are removed to the tent as directed. It is also essential that it be done the early part of the season, the earlier the better. In New-England and New-York, no worms should be brought out *after* the 20th or 25th of July.

On this system of feeding, the silk culture may be extended indefinitely, and as rapidly as trees can be multiplied. The silk grower may have tents located in different fields, wherever the soil is most favorable for the growth of the tree.

I have only to renew the earnest request that silk growers throughout the country will, the present season, make extended experiments, on a large or small scale, as they may choose, testing the great question involved in this matter. It may be done on Mr. Gill's plan, or any other, so that the essential principles be preserved, viz., *open feeding* from the first. Will editors interested in advancing the silk culture, publish this article? I propose to publish, in pamphlet form, the latter part of August, all the experiments that shall be made on this subject for general distribution.

[*American Agriculturist.*

WEST INDIA CORN AND ORANGES.

To the Editors,—I notice in your number for the present month, an extract from the Farmer's Encyclopædia, in which the writer, in speaking of Indian corn, states that "in the West Indier, it rises 30 feet in height; but with all that gigantic size, it produces only a few grains on the bottom of a spongy cob, and is counted on only as rough provender." I am surprised to see such a statement in a work of so much respectability, for it is at variance with the truth, and calculated to mislead many of your numerous readers. I resided in the British West Indies for upwards of 30 years, and state, without the fear of contradiction, that in those islands they generally raise good crops of corn. Its height is rather under that grown here, and the grain something smaller than our best 8 and 10 round yellow—but weighs heavy. The returns per acre, certainly fall short of what they are in the States, on good soil well manured and carefully cultivated, but I have raised 25 bushels per acre, from land which had never been manured, and that with less care than is usually bestowed on it here. The same writer also states, that in the West Indies, "the pulp of the orange is spongy, badly filled with juice, and has too much of a forced flavor to be pleasant." I am free to admit, that there are in that section of the world, oranges which correspond with this description; but at the same time I must remark, that there is also abundance of oranges equal to the best produced in any part of the world. J. T.

Hamilton Township, N. J., June 20th, 1843.

[*Farmers' Cabinet.*

EFFECT OF TREES IN AMELIORATING CLIMATE.

To the Editor of the New England Farmer:

Sir,—Sometime since, I wrote a communication for your paper, in which I gave some of my ideas on the subject of the probable effect of a proper distribution of trees in ameliorating the climate of a tract of country. Since that time, a farther investigation has led me to attach still greater importance to the subject, and to think that still greater advantages might be gained by a general and spirited attention to the subject. Although it may not be denied that clearing a country of a portion of the forests which for a long time have shaded its entire surface, has an effect to increase the general temperature of it, even though the work be indiscriminately executed, yet surely this can be construed into no argument against the opinion that the favorable effect would have been augmented in a great degree, had the work been done in a judicious manner.

It must be evident to the most superficial observer, that in our State at least, the work of the clearing away of the primeval forests has been performed in such a manner, that those portions of them which remain, and our cultivated lands, stand in very disadvantageous relative positions. There are too many highlands laid bare and too many lowlands uncultivated. That this manner of operation presented itself as the most natural, at the time of the first settlement, I will not pretend to deny: the humidity and fertility of the entire soil, preventing that want of those two important qualities, which many of our higher lands now experience. At that time they found the highlands moist enough for agricultural purposes—the lowlands far too much so. But now, (if I may be allowed to make the chain of my argument complete, by quoting from my former communication,) "the highlands by continued cropping, have become exhausted; whereas the lowlands, on account of their receiving the soil necessary for vegetation, washed from the higher lands, retain their fertility for a longer period, and probably never reach that permanent sterility which we so often perceive in our exhausted hills."

I have said that many of our highlands are exhausted, and I feel no inclination to correct the expression—I mean as far as they offer advantages for cultivation in comparison with most of our lowlands. How often, in our journeys through the country, do we behold large tracts of elevated land, so sterile that they seem scarcely able to afford nourishment to a crop of sickly mullens, and whose desolate and barren appearance affects us with painful emotions. The history of such a piece of land is plainly to be read upon its face. Here the father and grandfather of the present occupant, even to the earliest generations, have tilled and tilled and tilled. To produce alternate crops of corn and rye, has

been its task, and faithfully it has repaid the toil expended on its surface, till now, exhausted and weary of continued effort, nature can go no farther. The causes of its deterioration have been two-fold: first, the long continued annual draught upon its natural fertility; second, the facility afforded by a constant state of tillage, for the washing of a large portion of its consequently loose particles of soil, to the lands about its base. And how often have we only to turn our eyes a little distance—perhaps but to the opposite side of the highway—and we behold another piece of land belonging to the same proprietor, rich in nature's virgin strength and sterility, yet in useful productiveness, falling short even of the last observed. Nourished by the alluvial deposits of ages, here brakes and bulrushes, or at best, grasses of the coarser sorts, flourish in rank luxuriance. To the owner of these two pieces of land, I would say of the latter, reclaim it: here is productive strength yet undrawn upon, which of itself is able to bear the continued taxation of many years' cropping. Moreover, from its position, its constant reception of the washings of the higher lands, will prevent it from ever acquiring that almost invincible sterility of many of the higher lands about it. To such of our lowlands as admit of a proper regulation of that great fertilizer, water, by allowing, at pleasure, of its admission and expulsion, this remark will apply with peculiar force.

Concerning the exhausted field first spoken of, I have no hesitation in recommending to the owner, to cover it with forest trees. Cover it with forest trees, if you desire to put it to the most profitable use. To raise a crop of any esculent annual, you have, in effect, to *create* the soil for its sustenance, and that against obvious disadvantages—some of which are the following, viz: its liability to drought, on account of its elevated situation and loose composition, and its incapacity of retaining the various applications used for its enrichment, for similar reasons. These difficulties of improvement, it cannot be denied, form strong objections to the continuance of its culture. But even here, experience has proved that certain species of forest trees will flourish well. Once established, their spreading branches and fallen leaves contribute to their own necessary moisture and sustenance. Such is the readiness with which certain species of trees adapt themselves to almost every variety of soil, that I doubt whether there are any lands so barren that they may be said to be unimprovable. Even on our most barren and sandy wastes, pines and some other sorts of trees, thrive with surprising vigor.

If the facts above stated are true, (and in their assertion I believe I am sustained by the experience of others,) it cannot, I think, be denied, that the re-covering of some of our exhausted highlands with such timber trees as are adapted to their situations, and cultivating in their stead, some of our lowlands, whose productive power is as yet untasked, and whose position, independent

of their inherent fertility, better qualifies them for long continued agricultural operations, forms, at the present time, a part of a system of husbandry that would be most conducive to the profit of their proprietors.

Such are the motives to these practices, which present themselves to those whose sole object in ther agricultural operations is the direct pecuniary reward attendant on their labors.

But the principle object of my communication at this time, is to offer some remarks on the effect of such operations as have been recommended above, in ameliorating the climate of a tract of country,—an effect limited or extended, of course, in proportion to the limitation or extension of the producing causes. Trees affect the warmth of the atmosphere, both by the actual caloric imparted to it from their own vital warmth, and by their breaking the force of the winds. The advantages of a piece of land well sheltered on the sides most exposed to blasting winds, by impending groves, over one across whose bleak extent they are at liberty to traverse unchecked, must, I think, be apparent to any one. Take, for example, the eastern counties of our own State, (Mass.) and I know not how properly to estimate the value of elevated plantations of trees, in breaking the force of our east winds ; and indeed, I cannot but think that were such plantations generally and judiciously introduced, they would so break the force and harshness of these noxious winds, as not only to favor the culture of many tender plants, but also, by preventing, in a measure, those sudden changes to which we are exposed, so affect the general climate of the country, as to make it more healthy and genial, especially to those affected with pulmonary complaints.

But man is not the only animal whose comfort and well-being would be augmented thereby ; our domestic beasts, being unable to protect themselves against atmospherical changes, by artificial means, would experience far greater benefits than he. Indeed, my ideas on this subject are well expressed in the following quotation from the (Edinburgh) *Plant. Kal.* :—" When farm lands are exposed to high winds, interspersing them with strips of masses of plantation, is attended with obviously important advantages ; not only are such lands rendered more congenial to the growth of grass and corn, and the health of pasturing animals, but the local climate is improved."

" The fact that the climate may be thus improved, has in many instances been sufficiently established. It is indeed astonishing how much better cattle thrive in fields even but moderately sheltered, than they do in an open and exposed country. In the breeding of cattle, a sheltered farm, or even a sheltered corner in a farm, is a thing much prized ; and in instances where fields are taken by the season for the purpose of fattening, those most sheltelered, never fail to bring the highest rents, provided the soil is equal to that of the neighboring fields, which are not sheltered by

trees. If we inquire into the cause, we shall find that it does not altogether depend on an early rise of grass, on account of the shelter afforded to the lands by the plantations; but likewise, that cattle, which have it in their power in cold seasons, to indulge in the kindly shelter afforded them by the trees, feed better, because their bodies are not perceived by the keen winds of spring and autumn, neither is the tender grass destroyed by the frosty blasts of March and April."

Thus I have briefly given some of my ideas on the importande of the benefits to be gained by exerting ourselves to get our cultivated and wood lands into more advantageous relative situations, and have endeavored to support my own opinions in some degree, by citing the experience of others.

This subject, it appears to me does not receive the attention which its importance demands, from the community at large, neither is it sufficiently encouraged by our agricultural societies. It appears to me that they can scarcely do too much towards its encouragement, by means of pecuniary premiums, and can by no means, too strongly recommend it as a matter of general policy.

Ideas have an influence according to the source from which they come—and I am certain that nothing would so much conduce to a general attention to this subject, as the recommendation and encouragement of agricultural societies. The man who, by any extraordinary means, can, for one year, force a piece of ground to yield more than an average crop, is both honored, and rewarded by a premium; while he who on a barren waste, is providing a valuable inheritance for his posterity, is disregarded and neglected.

In a few instances, it is true, some of our agricultural societies have offered premiums for plantations of forest trees; yet as far as I am acquainted, these have never been attended with any conditions or recommendations as to relative location; and at one time particularly, I recollect being at an agricultural exhibition, where the Chairman of the Committee could not refrain from telling the successful claimant of a premium for a plantation of forest trees, that, in his opinion, he had covered with his flourishing grove, the most productive part of his arable land. To secure the advantages of any operations, they should be executed with discrimination.

Feeling, as I do, somewhat enthusiastic in this matter, I cannot but hope that it will, ere long, attract from the community an attention somewhat in comparison with its importance; and that our agricultural societies may come to see the propriety of giving it a share of that encouragement, which they are wont to bestow on, at least, not more important branches of rural economy.

OBSERVATOR.

[We are requested to insert the following article, taken from the *Charleston Mercury*.]

MR. RUFFIN AND THE PLANTERS—AGRICULTURAL ANALYSIS INDISPENSABLE.

The energy and zeal with which this gentleman has so far performed the duties assigned him, entitle him to the "well done" of the public—but more particularly of that body whose interests are most advanced by his labors—the Planters.

Thus far he has done his part—it is necessary that they should do theirs. He has disclosed to them that the low country abounds in beds of the richest marl, and within the reach of every planter—they must apply it to their soils—but they must do so with intelligence, not blindly, on proper principles, and not on conjecture, or else we fear all the anticipated benefits of marl will be lost—disappointment ensue—a reaction in the public mind unfavorable to agricultural improvement take place, and what would be much to be deplored, the agricultural survey abandoned.

It is essentially necessary to derive benefit from the use of marl, that planters should understand the elements of their soils—the nature of the plants they cultivate, and of the manures they apply; and all this can only be attained by chemical analysis.—Common sense indicates, that success in every pursuit depends upon a proper knowledge of its principles. This is requisite for the lawyer, physician, mechanic; but the planter seems to think himself a sort of privileged character—of the soil he works, he is to know nothing—of the plant he cultivates, and the manure he applies, he is to know still less; and when he loses his crop, he wonders at his want of success; and, that instead of a bountiful harvest, he has reaped the blight and the mildew.

To confine our observations in the first place to the two great staples, cotton and rice, we ask is there any adequate knowledge had of the soils of our cotton lands? Have their ingredients ever been ascertained with any particularity? Nothing but what is sensible to the sight, and little of that; yet, complaints are loud that the lands are failing—some essential ingredient is exhausted—the plant does not mature its fruit, bears with less fecundity, the fibre and staple are defective—all acknowledging and lamenting the fact; yet, not one step taken to discover the why or the wherefore. Marsh mud, which we have seen tried, and which contains no carbonate of lime, is found to stimulate and not to remedy, and other appliances fail. Is not the obvious remedy an immediate analysis of the soil? First analyze, for instance, a specimen of the original and virgin soil; this would shew the elements which enabled it to grow the plant vigorously at first—then analyze the present cultivated and worn soils; a comparison of the two would at once shew the ingredient in which the latter is deficient—and

the remedy to be applied. If lime be wanting the remedy would be marl.

The cotton soil of India is remarkable for its fertility—for 2 to 3000 years has it continued to afford abundant crops—and a most singular circumstance is, that *it never lies fallow, and receives the slightest manure.* Even the stem of the cotton plant is not allowed to remain on it, being used for the making of baskets or firewood. Its extent is prodigious, and it varies in depth from two and three to twenty and thirty feet. Its extraordinary fertility is probably owing in part to its great power of absorbing moisture from the atmosphere, and it originated, it is thought, from the disintegration of trap rocks, which in their composition show a *great proportion of potash*—and also *lime*. Might not the failing powers of our cotton lands arise from these two ingredients being exhausted by culture? One effect of marl certainly would be to increase the absorbent power—the *test*, according to an eminent writer, of the productive capacity of all soils.

An equal ignorance prevails as to the elements of our rice lands. Hitherto they have been deemed inexhaustable—masses of decomposed vegetable matter—and mines of boundless fertility. Yet despite the apparent riches of the soil, the average product is not over 40 bushels to the acre, and there is palpably a decrease in quantity—as well as deterioration of quality; the grain being smaller and softer, not as flinty and substantial as formerly, and unable consequently to undergo, as well, the process of pounding in the mill. Does not this prove that something is deficient? The great manure relied upon by the planters as a continued means of restoration to their worn soils—is the sediment, deposited by the flowings of the water, which is said to be decomposed vegetable matter. But is it vegetable matter, that is the renovating principle? This is by no means certain, for the fertilizing ingredient is just as probably lime, or the alkalies.

It was once generally supposed that the fertilizing properties of the inundations of the great river of India, the Ganges, was vegetable matter in various states of decomposition, from the circumstance that the tracts, within the reach of the inundation, preserved their original fertility unimpaired, and have continued to produce their full crops from time immemorial, while the higher tracts, not within the reach of the inundations, gradually and rapidly declined in quality. Some crops can not be repeated on these, except at intervals of three or four years.

But at length with a view to the improvement of the higher soils, and in particular reference to the culture of Indigo, the *Silt* or mud deposited by the inundations was analyzed, and gave the surprising result of but 2½ *per ct. vegetable matter,* which demonstrated that such matter was not the fertilizing principle it was supposed to be. On the other hand 8 *per ct. of calcareous matter,* appearing it seemed that this was the great property wanted, and an exten-

sive series of analysis of the higher soils showing farther an almost total absence of all calcareous matter, the inference was irresistible that the want of this ingredient was the cause of the exhaustion and sterility complained of. Lime was accordingly applied, though in a small proportion, and the result was the indigo crop increased 50 per cent. A most striking exemplification this of the great advantage, if not absolute necessity, of a strict analysis of the soil —of the beneficial qualities of lime: and showing the great aid science is capable of rendering to Agriculture.

One of the greatest crops of rice made on Cooper river in this State, we are informed, was made in *spite* of the planter. In consequence of a break in his dam—which he was unable to stop, the tide had free ingress and egress—a circumstance so contrary to all known rules of planting, that he looked of course for a total loss of crop, but the result was otherwise. To his incredible surprise it turned out the best crop ever made upon the land *before* or *since*. Now its unreasonable to suppose that this arose from some ingredient, possibly lime, in the sediment,—or held in solution by the water, being by the break in the dam, more abundantly supplied to the plant—than under the ordinary circumstances of culture?

An analysis would have solved the question and shown at once a necessity for some change in the mode of culture, and what it should be.

An analysis of the plant is as necessary as of the soil. The ashes of all Plants are found to contain the earth ingredients or inorganic elements in *certain* proportions peculiar to *each* kind. That of clover for example, is found to contain a great proportion of the sulphate of lime—which at once explains the mystery of this substance being so powerful a manure to it.

"Cotton gives one per cent ashes, of which 17 per cent is composed of phosphate of lime and magnesia." Might not this indicate what our cotton lands want, and what the plants require?

"The pollen of the *Pine trees* wafted about in clouds is composed of 3 per cent. of phosphate of lime and potash. May not this be one of nature's beautiful modes of supplying phosphoric acids to plants and soils." Might not the failure of our Sea Island crop arise from these ingredients being not only *exhausted* in *the soils*— but from the circumstance that the continual clearing of the lands has cut off the supply of phosphate of lime and potash from the pollen of the Pine tree? The ashes of the pine analized, shewed that these ingredients must have originally existed in the soil.

"Rice contains a notable portion of phosphate of time, not only in the grain but straw."

The grain contains 85 per cent. starch; this explain why decomposed vegetable matter of which our rice soils are composed, is so frvorable to its growth—but it also contains gluten and phosphate of lime—and hence a want of the ingredients in the soil to produce

these, with an excess of vegetable matter, is sure to produce light rice, and a small and soft grain.

The reasons which shew the necessity of an analysis of soils and plants, equally apply to manures—whether mineral or earthy—animal or vegetable—The mineral arsenic applied to the land would be destruction to its fertility and also to the plant—Saltpetre would benefit both.

Lime acts *mechanically* on the soil by division of its particles and rendering it light and friable; also *chemically* by absorbing moisture from the atmosphere, retaining manures and yielding them slowly to the wants of vegetation—manure is the food of plants and the knowledge of their nature is therefore essential to their proper application. "Corn grown in common vegetable mould (which a planter would esteem the *ne plus ultra* of manures) contains 66 parts of starch and only 9½ gluten—manured with blood it will be found to contain 45 parts of starch and 45 of gluten. The *latter* quality is that which renders grain of any kind, hard, heavy and nutritious. Hence the necessity of understanding what manures produce this.

The foregoing observations are made to shew how requisite it is in order to make the discovery of marl valuable, that our planters should understand the elements of their soils, of their plants and manures—otherwise it may be applied when it is not wanted, or in improper quantities, or when not at all applicable to the plants, and consequent failure ensue, and disappointment when success could not rationally have been expected. At present the Agriculture of our State is but a blind pursuit; the term *rational* applied to it would be a misnomer; but a spirit of improvement we are happy to see is awakened, which promises to be progressive and carry with it the richest results. The steady combination, for a few years, of energy and science, would exhibit its glorious fruits in the gradual renovation of our impoverished soils, and convert what now are neglected and sterile wastes into tracts of smiling fertility.

B. R. SMITH.

MISCELLANEOUS.

MISSISSIPPI HEMP.

We received on Tuesday morning by the steamer Missouri, a bundle of as excellent hemp as was ever grown in any country, raised by Mr. W. P. Warfield, of Bachelor's Bend, in this State. As will be seen by the annexed letter, the yield is fine, and there is no mistake as to the quality, which is as heavy, strong-linted and fine as we ever saw. Mr. Warfield is one of the most experienced and systematic planters in the south. He is, we believe, the first person who has demonstrated the susceptibility of our soil and climate to the growth of this valuable staple of the west.

[*Free Trader.*

Bachelor's Bend, Washington County, Mississippi, Dec. 14th, 1843.

Dear Sir,—Accompanying this note, I send you a specimen of hemp grown in Bachelor's Bend, it is water rotted. You will perceive that the lint is heavy and very strong; the boy who broke it, is an experienced Kentucky hemp breaker. He says he never broke heavier linted hemp.

You may remember that my anticipations were very sanguine, whilst my little crop of hemp was in progress of growth. I now assure you, that they have been more than realized, both in the quantity and quality. I have a quantity in process of dew rot, (the manner in which it is chiefly rotted in Kentucky,) and when broken out, I will send you a specimen. I will have the ground on which it grew, accurately measured and the hemp weighed, and give you the quantity grown on an acre. I will venture to guess from the size of the stalks, that it will yield from 800 to 1,000 lbs. per acre, which is considered in Kentucky a good crop. I am so well satisfied with the result of my experience, that I will extend its culture considerably the next year. I promised to let you know the quantity of corn I made per acre this season. Mr. Fish, my overseer, measured what he supposed an average acre, and the result, 90 bushels. Very respectfully yours,

W. P. Warfield.

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LARGE YIELD OF CORN.

In a number of the Louisville Journal, we find an account of a corn crop raised by Mr. Young, of Jessamine County—a crop exceeding, we believe, any on record in the country. The editor says: "Mr. Young exhibited to us a certificate of several respectable gentlemen, certifying that in a lot of five acres, he had produced *one hundred and ninety-five bushels of corn to the acre.* The corn was measured and there is no doubt of the correctness of the estimate. This was on a piece of bottom land, and the committee were of opinion that Mr. Young's crop on the upland was better than that which was measured." Mr. Young pens his stock on the land intended for corn, and manures it in no other way. This land is broken up in the fall, in the spring struck out in squares three feet each way, from eight to twelve corns dropped in each, which at the hoeing is reduced to four stalks to each hill. As soon as the corn is up, a large harrow is run over the whole ground, regardless of harrowing the corn up, which seldom happens. Nothing but the plough is used in the cultivation; after the harrow, no hoe or cultivator is brought to the field.

[*Albany Cultivator.*

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SCOTCH METHOD OF MAKING CHEESE.

A number of our subscribers have requested us to republish an article which appeared in the Ploughman on the 18th of June last, relating to a new mode of making cheese. We then requested

our correspondents to try it and let us know how they liked it Some months ago we published a letter from one of them, who was much pleased with the new mode, having successfully tried it. It may be very convenient for those who have small dairies.

[*Mass. Ploughman.*

New Method of Making Cheese.—We have lately seen a method of making cheese, which is worthy of being tested by experiment at this season of the year, especially by those who have but a small quantity of milk. It is very simple, and easily tried. The milk is set in the ordinary every morning, and the curd separated from the whey as well as it can with the hands. It is then pressed compactly into the bottom of the earth pot, and covered over with several folds of dry linen, or cotton cloth. By this process the remaining whey is absorbed, and when the cloth becomes saturated it is removed and a dry one placed in its stead. In the course of the day and night this process removes the whey as thoroughly as can be done by pressing. The next morning the milk is prepared in the same manner, and the curd is packed closely upon the top of that prepared the day previous, and the same method pursued in separating the moisture. This process to be repeated till you have a cream pot full of cheese. It is thus seen to be a convenient method where the dairy woman has the milk of but one or two cows. If it work well, it is an important discovery. If it fail, it need not be a very disastrous failure. It is a very successful way of preserving cheese from flies and mice, as it can be perfectly enclosed and kept from the air and light. We have seen but one experiment of this kind, and this promises to be a successful one. The cheese appeared as free from moisture and as solid as that made by the press. The labor is much less, and the care of it afterwards is comparatively nothing.

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CHANGES IN COMPOSITION OF THE MILK IN COWS, &c.

The cow being in good milking condition, and at the time fed upon after-grass, he ascertained the average amount of her milk for five days, and then proceeded to analyse it. In the first day it was observed that the milk of the evening contained 3.7 per cent. of butter, and of the following morning, 5.6 per cent. The deficiency in the first observation is referred to the consumption of a greater portion of the butter, or its constituents, from respiratory exodiation during the day, when the animal was in the field, than during the night, when it was at rest in the stall. When confined during the day, and fed with after-grass in a shed, the butter amounted to 5.1 per cent. When fed with portions of potatoes, hay, and bean flour, the butter was 6.7 per cent.; with hay and potatoes, 4.6 and 4.9 per cent. PLAYFAIR.

[*U. S. Farmer.*

TEXIAN GRAPES.

We have been informed by an intelligent botanist, that twenty-five different varieties of the grape have been discovered in the forests of Texas; some of which, when properly cultivated, will yield wine equal to that made from the best imported grapes.—The Post Oak grape, which grows so luxuriantly on the hills bordering the Colorado and other western streams, when cultivated in a good soil, will yield wine of an excellent flavor. There is a variety of grape which abounds on the sandy ridges near the sources of the Guadaloupe, that is called the Sand grape; and Europeans who have seen them, say that they are superior in flavor to any grapes that they have eaten in Europe. There is also a variety of grape that has recently been discovered in the valley of the Bosque that produces large bunches of white grapes, similar, in appearance, to the sweet water. Mr. Smith, who has seen them, mentions that they are superior in flavor to the sweet water, and no doubt would improve greatly if cultivated with the care that is usually bestowed on the sweet water variety. We have also learned that there are some varieties of grapes so large, that the single berries are often found over two inches in circumference. We hope some of our horticulturists will make experiments in the culture of these varieties—for it is not improbable that they are so improved as to surpass the varieties that are imported at so great an expense.

[*Texan Telegraph.*

EIGHT THINGS THAT DO NOT LOOK WELL.

It does not look well to let the garden grow up to weeds, and then say that a garden is good for nothing.

It does not look well to have the gate without hinges, held up in the gateway by a prop in a "slantindicular" position, leaving at the bottom an aperture through which some hog with a convenient nose can rub, and so slip around into the garden.

It does not look well for a man to thump and abuse his horses or oxen, just to try his whip; or to suffer his boys to do so.

It does not look well to keep the horse in a stable not cleaned, till his hind feet are 45 degrees higher than his fore feet, so that he is obliged to rear up to get himself on a level every time he wishes to swallow a little hay or oats.

It does not look well to have the woman hang out the clothes on rough and thorny bushes, and tear them in getting them off, when a neat line would save that trouble.

It does not look well for a man to keep six lank, hungry greyhounds, when he can keep no cow or pig; and for no purpose but to worry the neighbors' cattle, and annoy the neighborhood with continual barking.

It does not look well for farmer's daughters to be always talking about piano playing and the trillings of Signor Cantanini; while

they do not know of what butter is made, and pretend to suppose a cow a rhinoceros.

It does not look well for any body's daughters to walk the streets in kid slippers in December, and lace themselves so cruelly that their voices waste away, and their cheeks turn to the color of moonlight. [*Prairie Farmer.*

PROFESSOR LIEBIG.

This popular writer upon Agricultural Chemistry, when in England, was in Yorkshire, attending agricultural meetings, and is said to have displayed every disposition, to communicate information to all who asked it. He is quite a young man—32—and has done more than any other person now living, to "make two blades of grass grow where only one grew before." Sir Humphrey Davy, before Liebig was born, lectured on Agricultural Chemistry. But the German has reduced to a practical system, what was not much more than a theory with Davy. At Edinburg and Aberdeen, there are now established University Professorships of Agriculture, as well as at Oxford and Cambridge. This shows how completely the public are aware of the importance of cultivating agriculture as a science. Captain Barclay has made a fortune by attending to the changes of crops and breeding of stock. Let others take the hint and do likewise.

[*Farmers' Cabinet.*

THE DISEASE CALLED HOOKS—PTERIGIUM.

MR. EDITOR,—In the April No., page 84, there is an inquiry by A. Beach, for information on the above disease—its nature, origin, remedy, and whether or not it be contagious.

The disease is not contagious. It has its origin in a thickened condition of the white coat of the eye-ball, (*Tunica Sclerotica,*) just where the upper and lower eyelids meet together in shutting the eye; the pressure of the lids and frequent winking, appear to pinch up a small fold of said coat. Irritating causes, by degrees, induce inflammation in it, and the blood vessels which in health carry only lymph or white blood, now become enlarged and circulate red blood, and appear fan-shaped, converging from the corner of the eye towards the pupil, and threaten to cover the glass of the eye (*Cornea*) with a film.

The only perfect or sure remedy for the disease, when confirmed, consists in catching or hooking up this thickened mass of vessels, on the point of a sharp hooked needle, (*Tenaculum,*) and cutting off the fold thus hooked up with a pair of scissors, cutting transversely, or across the vessels, until all are divided.

[*Prairie Farmer.*

Encourage youth to contend with and overcome difficulties.

THE PEA BUG.

So well acquainted are most persons with this insect, that it needs no description, but the way it gets into the pea is not generally known. The egg is deposited on the outside of the pod; it is of a yellowish colour, resembling that of the horse bee, though not quite so large; it adheres to the pod opposite to the pea on each side, when it hatches and bores its way through the pod into the pea, where it is transformed into a bug, and remains there until the next spring, when it comes out and flies about, and waits for the pea to grow.

[*New Genesee Farmer.*

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POULTRY YARDS.

Every farmer should supply his table chiefly with fresh meats from his poultry yard. By proper attention, it may also be made a source of profit in addition. A yard of suitable size, enclosed with pickets, including a poultry house, and a supply of fresh water, and a pond to wash in, are indispensable to the success of raising poultry.

To ensure a plentiful supply of eggs in winter, let the fowls have a warm habitation in which they can remain through the day in cold severe storms, with room to move about. Place a trough about four inches wide and four inches deep, and length according to circumstances, within the yard, with a roof so low as to prevent their getting into the trough; keep this well supplied with feed, that they may have it by them constantly. In summer, let them out once or twice a day to ramble awhile, if you have no crops near enough to be injured by their depredations. As they are somewhat carnivorous, some kind of fresh meat is necessary for them once a day in winter, when they are not supplied with insects.

No poultry is profitable to be kept after three years old. Something depends however, on the breed and the manner in which they are kept. The Poland top-knots are considered as the best for eggs, and are sometimes called everlasting layers. They are more hardy than most kinds, for the extremes of weather.

[*Farmer's Gazette*

—

The brine in which cucumbers have been preserved, is said to be fatally poisonous to cattle and hogs. One of our citizens a few weeks back, lost a cow from her having eaten a quantity of pickles which had been thrown out in an exposed situation.

[*Piscataquis Herald.*

—

A princely mind will ruin a private fortune—keep the rank in which Providence hath placed you; and do not make yourself unhappy, because you cannot afford whatever a wild fancy might suggest.

MONTHLY CALENDAR

OF

HORTICULTURE AND FLORICULTURE.

FOR SEPTEMBER, 1843.

VEGETABLE GARDEN.

Bush Beans.—You may in the early part of this month still plant a few Bush or Snap Beans. This work, however, should not be delayed. Let the earth be drawn up to the stems of the Beans planted last month.

Peas.—If you have neglected sowing Peas in August, you may venture to sow some early in this month, those that have been sowed last month will now require sticks 4 or 5 feet high. Let them also be carefully hoed.

Cauliflower and Brocoli Plants.—You may now transplant cauliflower and Brocoli Plants in the manner directed in former months, say 2½ by 3 feet in rows, water the plants carefully until they take root. An excellent mode of preserving Cauliflower and Cabbage Plants from the depredations of the cut-worm, is to wrap a paper around the stem, extending an inch above the surface and a little below it; the worm usually cuts off the plants immediately on the surface of the earth.

Cabbages and Savoys.—Towards the middle of this month you may begin to transplant the Early York, Sugar Loaf, and Savoy Cabbage Plants, sown in the last month. Let your beds be well dug and some good manure spaded in. Let the Early York be set out a foot and a half apart, and the Sugar Loaf and Savoys a foot and nine inches.

If the weather should prove very wet, you may plant your Cabbages on small beds or ridges. If you have omitted sowing your Cabbage seeds it is not too late to attend to this duty in the early part of this month. Your Cabbage seeds had better be of European importations.

Turnips.—If you have not sown any Turnips last month, it is necessary that this work should be attended to as early as possible; the Red Top and Early Dutch are the best kinds, sow the seeds as advised in former months, and let them be carefully thinned.

Carrots and Parsnips.—If these were omitted to be sown the last month, let them now be attended to, they will be sufficiently large for use in December or January.

Endive and Lettuce.—You may continue to sow seeds of these plants, but the sooner the better, as it is requisite that they should acquire a sufficient degree of strength before the cold weather sets in.

Celery.—The Celery Plants which were put out in the last month, and in July, will now require a little fresh earth to be drawn towards them. Care must be taken that the earth does not fall into the hearts of the plants, which would choke them. You may put out more Celery if you have not a sufficient quantity already, as there is sometimes an advantage in planting at intervals of some weeks from each other.

Onions.—You may now sow Onion Seeds for a general crop. They may be sowed about the middle of this month, in drills about 8 inches apart, on beds 3 or 4 feet wide. The seeds may be put in pretty thick.

Radishes.—The different kind of Radishes, such as the Salmon and black and white winter Radish, may now be sown, the latter especially succeed remarkably well when sown this month.

Spinach.—Spinach may be sown at any time in the present month. Let the seed sown in the last month be carefully hoed.

FRUIT GARDEN.

Very little can be done in the Fruit Garden this month.

Strawberries.—This is the proper season to set out Strawberry Plants. Let the ground be well dug and manured, divided into beds 4 feet wide, allowing 15 inches for the alleys, and let them be 5 or 6 inches deep. The plants set out about 10 or 12 inches apart.

CHARLESTON, MARKET HALL, August 21, 1843.

Memorandum of Stock, &c. brought to Market during the week ending 19th inst., viz.—232 Beeves—132 Calves—73 Hogs—53 Sheep—49 Lambs—18 wagons with Poultry, &c.

PRICES CURRENT THE PAST WEEK.

Beef 4 a 8 cts. per lb.; Veal 10 a 12½ do. do.; Pork 8 a 10 do. do.; Mutton 8 a 10 do. do.; Lamb 10 a 12½ do. do.

ROBT. MACBETH, Clerk of Markets.

THE MAGNET,

DEVOTED to the Investigation of Human Physiology, Physiognomy Cephalonomy, Pathology, Phrenology, Neurology, Psychology, Electricity, Galvanism, Magnetism, Light, Caloric, Life. By Le Roy Sunderland.

The design is to illustrate those states of the mind, called Somnambulism, Mesmerism, Dreaming, Second-Sight, Somnipathy, Trance, Clairvoyance, and various other Mental Phenomena which have, hitherto, remained shrouded in Mystery. Its pages are enriched with Essays and Communications, detailing facts, illustrating the Science of Cephology, which teaches the Influences and Susceptibilities of the Human Brain, and the method of controlling its separate organs by Positions, for the Relief of Human Suffering.

☞ The Second Volume of this interesting Work, will be commenced June 1st, 1843. It will be issued in large octavo form, on New Type, and published Monthly, at $2 a year, or 15¢ cents single, for the Proprietor, by PETER E. GOOD, 138 Fulton-street, New-York—where Subscriptions are received.

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I. Two Dollars, in advance, will pay for one copy for the year; or thirteen copies of any one number.

II. For Six Dollars, fifty copies of any one number; or four copies for one year.

III. For Ten Dollars, ninety copies of any one number; or seven copies for one year.

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V. To the trade, they will be put at Nine Dollars per hundred, when one hundred copies are ordered at one time, with the cash in advance.

☞ Agents must state distinctly, what the money sent is designed to pay for; whether for an entire volume, or for so many single copies of one number.

☞ All payments must be received by the Publisher, before each number is sent out of the Office.

☞ All payments must be remitted free of Postage, and in Sealey-fund money, or its equivalent, in this city.

☞ Agents must give give particular instructions as to the manner in which they may wish each number forwarded.

☞ Every Editor who shall give this Prospectus (including this paragraph) six insertions, shall receive THE MAGNET for one year, from June, 1843, provided the papers containing this notice be forwarded, marked, to "The Magnet, New-York City;" and provided also, that these conditions be complied with before January, 1844.

July 1. 6t

RUFFIN'S CALCAREOUS MANURES.

ELEMENTS OF AGRICULTURAL CHEMISTRY,

In a Course of Lectures for the Board of Agriculture, delivered between 1802 and 1812. By Sir H. Davy.

WESTOVER MANUSCRIPTS,

Containing the history of the Dividing Line between Virginia and North-Carolina. By Wm. Bird of Westover.

THE BANK REFORMER No. 1.—By Edmund Ruffin.

THEORY AND PRACTICE OF DRAINING AND EMBANKING. By John Johnston, Esq.

For sale at A. E. MILLER'S, No. 25 Broad-st.

A DAY ON COOPER RIVER.

BY JOHN B. IRVING, M. D.

THE Interesting Numbers of "A Day on Cooper River," with an addition to the Fifth Number, containing Mr. Hyrne's mode of Cultivating Rice, have been published by the Subscriber, in pamphlet form.—Price 50 cents.

A. E. MILLER, 25 Broad-street.

LIST OF PAYMENTS.

For 1842.

Col. Thomas Lehre,
Miss Pinckney,
John H. Tucker,
Edward Barnwell, sr.
Edward Barnwell, jr.
J. K. Mazyck,
Edward McCrady,

Thomas L. Webb,
Ashley River Agricultural
Samuel Lynes, jr.
B. J. Howland,

For 1843 & '44.

James G. Landen, Esq.

TO OUR READERS AND CORRESPONDENTS.

We regret to state that several valuable communications were promised us, had not reached before closing this [number]. Our friend in Georgia, who promised the article on "Pine Rice Land," is respectfully informed that it has not been received if it has been sent. In this number, two or three articles on the subject will be found, which will call the attention of Rice Planters to the subject. Mr. B. R. Smith's article which was by requst from the *Charleston Mercury*, will, we doubt not, give rise to some improvement in the cultivation of that indigenous article of food, in the Southern States.

We again appeal to the Patrons of this Journal, for their continued support; and solicit them to aid us in procuring additional subscribers, to indemnify us for its publication. If such aid can be procured, we have no objection to make it a Weekly Journal of either octavo, or *quarto* medium size, for the same price per annum.

A New and Cheap Daily Paper.

The public is respectfully informed, that as soon as the necessary arrangements can be completed, will be issued from the Press of Miller & Browne in this City, on an entirely new, cheap and attractive plan, the first number of a daily Journal of *Belles Lettres*—the *Beau-monde*—and *Les Nouvelles du Jour*, to be entitled

JOHN B. IRVING, M.D. EDITOR. **THE RAMBLER** MILLER & BROWNE PUBLISHERS.

"An Abstract and brief Chronicle of the Times."

Two Dollars for Six Months, payable in advance.

☞ Subscriptions will be received by Dr. J. B. Irving, or A. E. Miller, No. [illegible] Broad-street. The patronage of the public is respectfully solicited.

Charleston, Aug. 23, 1843.

☞ **The Subscribers to the Southern Agriculturist are reminded, that the Price of the Journal was reduced this year to all those who paid in advance; those who are still in arrears for this and former years are respectfully solicited to make their payments.**

BOOK & JOB PRINTING

Neatly executed at this Office.